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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,534

03/17/2006

Antonio Toro

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2785

22852

7590

10/27/2009

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EXAMINER

KWON, ASHLEY M

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

10/27/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/572,534	TORO, ANTONIO	
	Examiner	Art Unit	
	ASHLEY KWON	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 9-13 is/are rejected.
- 7) ☒ Claim(s) 5-8, 15 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/17/06 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

In response to the amendment received February 25, 2009:

- a. Claims 1-13, 15 and 16 are pending;
- b. Claim 14 was previously canceled;
- c. A new objection has been made to the drawings;
- d. New prior art rejections have been made in light of applicant's amendments.

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how “said cooling fluid” is fed to “a fuel cell adjacent to the separator”. If the cooling fluid consists of one of the reactant gases, then it is possible for the gases to be fed to an adjacent fuel cell. However, if the cooling fluid consists of water or any other fluid it is unclear if it would be fed **into** the fuel cell or if it would merely flow on the periphery of the fuel cell in order to cool it. Applicant is please asked to clarify.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

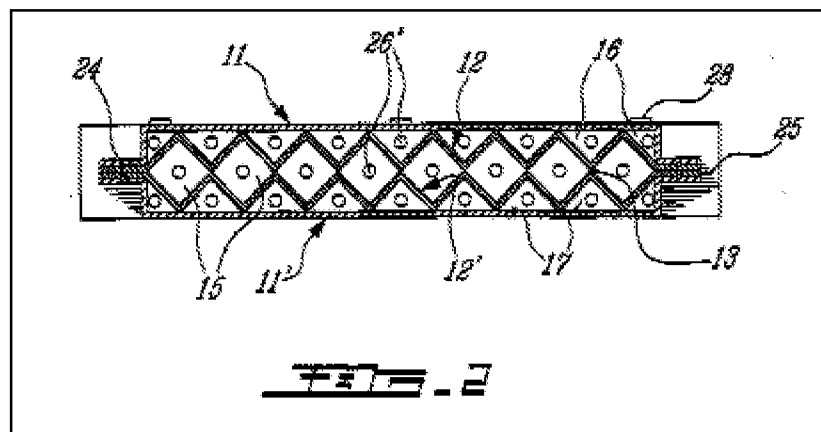
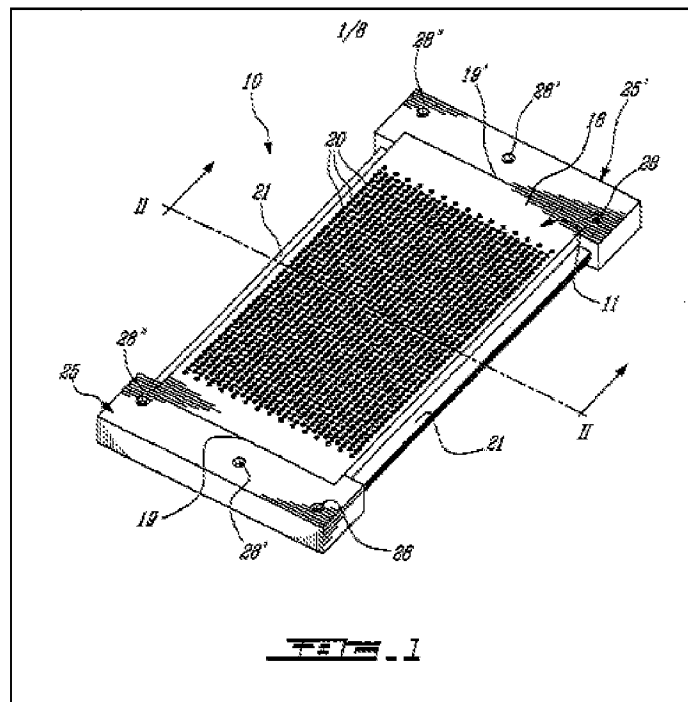
Claims 1, 2, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Condeescu et al. (WO 02/023645) (hereinafter “Condeescu”).

Regarding claim 1, Condeescu teaches a bipolar separator (bipolar separator plate assembly, 10) for a fuel cell stack, comprising a cathode sheet and an anode sheet (distributor plates 11, 11'), at least on of said sheet provided with fluid passage holes (perforated with holes, 20) (see pg. 5, lines 1-7 and 24-25; figs. 1 and 2); at least one corrugated conductive element (separator plates 12, 12'), wherein said cathode sheet and said anode sheet are welded through said at least one corrugated conductive element (separator plates 12, 12') (see pg. 6, lines 1-7) and wherein a cooling fluid passage (outer gas channel, 16 and 17) is formed between the corrugated conductive element and at least one of said cathode sheet and anode sheet. The flanges of the separator plates and distributor plates are welded together by longitudinal line resistance welding at 24 (see fig. 2, see pg. 6, lines 1-7), therefore said cathode and anode sheets (11 and 11') are welded through both the corrugated conductive elements (12 and 12'). Barring further specification of “a cooling fluid”, any gas or liquid will be interpreted as being able to function as a cooling fluid. Under this interpretation, a cooling fluid passage (16 and 17) is formed between the corrugated conductive element

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(12 and 12') and at least one of said cathode sheet and anode sheet (12 and 12'). The fact that applicant calls the sheets "cathode" and "anode sheet" is intended use.

Depending on which side of the fuel cell the sheets are on determines whether it is the anode or cathode side.



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Regarding claim 2, Condeescu teaches the separator of claim 2, wherein said fluid passage holes (holes, 20) are gas feed and/or discharge holes disposed in one or more peripheral regions of at least one sheet. Gas fed through the groups of gas channels (16 and 17) permeate through the holes (20) of the distributor plate (11) (see pg. 5, line 28-31). It is clearly shown in fig. 1 that the holes are placed throughout the sheet. Therefore this claim is anticipated.

Regarding claim 4, Condeescu teaches the separator of claim 1, wherein at least one corrugated conductive element (separator plates 12, 12') adjoins said cathode and anode sheets (distributor plates 11, 11') generally along the whole surface of the separator (see fig. 2) and said cooling fluid passage section (16 and 17) comprises channels delimited by the surface of said corrugated conductive element (see fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Condeescu as applied to claims 1.

Condeescu fails to explicitly teach the separator of claim 1 wherein said fluid passage holes comprise calibrated orifices for feeding a flow of said cooling fluid a fuel cell adjacent to the separator. He teaches that gas fed through outer gas channels 16 and 17 permeate through the perforated holes (20) of the distributor plates (11, 11') (see pg. 5, lines 23-33). He also teaches that in the construction of a fuel cell, membrane electrode assembly sheets are interposed between the separator plates as is obvious to a person of ordinary skill in the art (see pg. 7, lines 28-33). Therefore it

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would have been obvious to one of ordinary skill in the art that the gases in the outer gas channels would be fed to a fuel cell adjacent to the separator.

Claims 1 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Facci et al. (WO 02/078112) (hereinafter "Facci") in view of Condeescu.

Regarding claim 1, Facci teaches a bipolar separator (bipolar conductive sheet, 2) for a fuel cell stack (see pg. 6 line 1).

Facci fails to teach the bipolar separator comprising a cathode sheet and an anode sheet, at least one of said sheets provided with fluid passage holes; at least one corrugated conductive element, wherein said cathode sheet and said anode sheet are welded or metallurgically bonded through said at least one corrugated conductive element, and wherein a cooling fluid passage is formed between the corrugated conductive element and at least one of said cathode sheet and anode sheet.

However, Condeescu teaches a bipolar separator (bipolar separator plate assembly, 10) for a fuel cell stack, comprising a cathode sheet and an anode sheet (distributor plates 11, 11'), at least one of said sheet provided with fluid passage holes (perforated with holes, 20) (see pg. 5, lines 1-7 and 24-25; figs. 1 and 2); at least one corrugated conductive element (separator plates 12, 12'), wherein said cathode sheet and said anode sheet are welded through said at least one corrugated conductive element (separator plates 12, 12') (see pg. 6, lines 1-7) and wherein a cooling fluid passage (outer gas channel, 16 and 17) is formed between the corrugated conductive element and at least one of said cathode sheet and anode sheet. The flanges of the

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separator plates and distributor plates are welded together by longitudinal line resistance welding at 24 (see fig. 2, see pg. 6, lines 1-7), therefore said cathode and anode sheets (11 and 11') are welded through both the corrugated conductive elements (12 and 12'). Barring further specification of "a cooling fluid", any gas or liquid will be interpreted as being able to function as a cooling fluid. Under this interpretation, a cooling fluid passage (16 and 17) is formed between the corrugated conductive element (12 and 12') and at least one of said cathode sheet and anode sheet (12 and 12'). The fact that applicant calls the sheets "cathode" and "anode sheet" is intended use.

Depending on which side of the fuel cell the sheets are on determines whether it is the anode or cathode side. The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, A.). It would have been obvious to a person of ordinary skill in the art to combine the bipolar separator plate assembly of Condeescu with the fuel cell (1) taught by Facci in order to provide a liquid cooled bipolar separator plate assembly which provides good distribution of gas, oxidant, and cooling fluid (*Condeescu*: see pg. 2, lines 21-24).

Regarding claim 9, Facci in view of Condeescu teaches the separator of claim 1, wherein at least one of the said anode and cathode sheets comprises a sealing gasket (*Facci*: gasket, 3; see pg. 6, lines 5-7) secured to the side opposite to the one whereto said corrugated conductive element is welded or metallurgically bonded to. Facci teaches in figure 1 that the gaskets (3) are on either side of the bipolar sheet (2). At least one of said anode and cathode sheets (*Condeescu*: distributor plates 11, 11')

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comprises a sealing gasket (*Facci*: gasket, 3) secured to the side opposite to the one where to said corrugated conductive element (*Condeescu*: separator plate 12, 12') is welded or metallurgically bonded to.

Regarding claim 10, *Facci* in view of *Condeescu* teaches the separator of claim 1 wherein at least one of the said anode and cathode sheets (*Condeescu*: distributor plates 11, 11') comprises a current collector (*Facci*: 4) bonded to the side opposite to the one where to said corrugated conductive element (*Condeescu*: separator plate 12, 12') is welded or metallurgically bonded (*Facci*: see fig 1).

Although *Facci* does not expressly teach that the current collector is welded or metallurgically bonded to the side opposite to the one where to said corrugated element is welded, he does teach that the bipolar sheet and the current collector could be made by a single integrated element (*Facci*: see pg. 6, lines 16-18). A person of ordinary skill in the art would have found it obvious to weld or metallurgically bond the current collector to the distributor plate taught by *Condeescu* in order to make it into a single element and keep it in place.

Regarding claim 11, *Facci* in view of *Condeescu* teaches the separator of claim 10 wherein said current collector is an electrically conductive reticulated element optionally selected from the group consisting of metal foams, metal meshes, expanded sheets and sintered metallic materials (*Facci*: see pg. 6, lines 11-13).

Regarding claim 12, *Facci* in view of *Condeescu* teaches a fuel cell stack comprising at least one separator of claim 1 (*Condeescu*: see pg. 7, lines 22-23).

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Regarding claim 13, Facci in view of Condeescu fails to explicitly teach the stack of claim 12 comprising at least one feed or discharge duct in communication with said fluid passage holes. However, Condeescu teaches that hydrogen gas and oxidant gas distribution devices form part of a fuel cell assembly and are obvious to a person skill in the art. Therefore it would have been obvious to one of ordinary skill in the art that there would be at least one feed or discharge duct in communication with said fluid passage holes.

Allowable Subject Matter

Claims 5-8, 15, and 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The closet prior art, Condeescu, teaches a bipolar separator for a fuel cell stack, comprising a cathode sheet and an anode sheet, at least one of said sheets provided with fluid passage holes, wherein said sheets are welded through at least one corrugated conductive element and said sheets delimit a passage section of a cooling fluid. However, Condeescu fails to teach a separator wherein at least one corrugated conductive element adjoins said cathode and anode sheets **only** in one or more peripheral regions of the separator, the gas feed and/or discharge holes are located **only** in one or more peripheral regions, and a reticulated element interposed between said anode sheet and said cathode sheet.

Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **ASHLEY KWON** whose telephone number is (571)270-7865. The examiner can normally be reached on Monday to Thursday 7:30 - 6 pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ASHLEY KWON/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795